Space Weather Forecast

Issued on Wednesday, 01 May 2024 at 00:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate-class flares likely with a slight chance of Strong flares through the period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is at Moderate levels with a large Moderate flare peaking at 30/2346 UTC, and three further lower Moderate class flares at 30/0114 UTC, 30/1510 UTC and 30/1630 UTC, all originating from AR3654. There are currently five sunspot regions on the visible disc, though a new region is appearing on the southeast limb and will be added to the list as soon as an analysis can be made. The large region in the western disc continues to dominate the flare risk. This region continues to show significant complexity within its intermediate portion in recent imagery despite the increasingly distorted viewing angle as it moves towards the western limb. Remaining sunspot regions are all significantly smaller and simpler in comparison.

No clearly Earth directed Coronal Mass Ejections (CMEs) identified in available imagery over the last 24hrs.

Solar Wind / Geomagnetic Activity: Solar winds initially on a declining trend, with a weak CME arrival at 30/1135 UTC ongoing. Wind speeds initially eased from around 420 km/s to near 380km/s, jumping to 420 km/s after the CME arrived. The Interplanetary Magnetic Field was initially weak, but saw a number of stepwise increases after the CME arrival, reaching a peak of moderate levels by the end of the period. The north-south component, Bz, initially weakly positive, saw erratic negative drops following CME arrival, with a minimum of -8/-9nT recorded. Geomagnetic activity was Quiet to Active (Kp 1-4).

Energetic Particles / Solar Radiation: Solar radiation was at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate solar activity likely to continue with further Moderate flares now considered likely, and a slight chance of Strong flares, principally from the large and complex group in the west of the disc.

Solar Wind / Geomagnetic Activity: There are currently two CME featuring in the forecast, the first appears to be producing the current CME enhancement. The second is associated with an eruption near centre disk approximately 29/0930UTC. Modeling suggest the risk of a glancing blow from this feature sometime during Day 3 (3 May).

Solar winds currently slightly elevated around 400-420km/s and experiencing weak CME effects, these likely to continue through Day 1 (1 May), with a potential weak fast wind connection perhaps bringing elevated wind speeds briefly. Conditions then expected to gradually return towards background through Days 2 and 3 (2-3 May). Further fast solar wind influence may see another increase in wind speeds back to elevated levels later on Day 3 into Day 4 (3-4 May).

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Geomagnetic activity is expected to be generally Quiet to Unsettled, but Active intervals likely at times under weak CME influence and potential fast solar winds, with a slight chance of a G1/Minor storm interval throughout.

Energetic Particles / Solar Radiation: Solar radiation is most likely to remain at background levels through this period. There is a slight chance for an S1 or greater event, with the large, complex sunspot in the western quadrant posing the main risk as it continues to rotate westwards.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	60
Very Active	R3 to R5 X	No	15	15	15	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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